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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/915,939	07/25/2001	Amit P. Singh	1014-170US01	8246

28863 7590 07/11/2007
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EXAMINER	
MEW, KEVIN D	
ART UNIT	**PAPER NUMBER**
2616	
MAIL DATE	**DELIVERY MODE**
07/11/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/915,939	Applicant(s) SINGH, AMIT P.	
	Examiner Kevin Mew	Art Unit 2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _25 April 2007_.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _2-15,18-55,58-81 and 83-95_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) _2-15,18-41,60-62,71-81,83 and 84_ is/are allowed.

6)☒ Claim(s) _42-55,58,59,63-70 and 85-95_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _7/25/2001_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Final Action

Response to Amendment

1. Applicant's Remarks/Arguments filed on 4/25/2007 have been considered. Claims 2-15, 18-55, 58-81, 83-95 are currently pending and claims 1, 16-17, 56-57, 82, 96 have been canceled by applicant.

2. Acknowledgement is made of the arguments made by applicant with respect to the objection to drawings set forth in the previous Office action. The arguments are persuasive and the objection to drawings is now withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 42-43, 45-51, 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art, Malcolm et al. (WO 00/07124), in view of Sarkissian et al. (USP 6,771,646), and in further view of Huai et al. (USP 6,614,785).

Regarding claims 42, Malcolm discloses a system for decoding one or more repetitive data blocks in data communicated over a network comprising:

an decoder module (**a leaf cache**, element 111, Fig. 1), coupled in the network (**coupled in a communication network**, element 100, Fig. 1), the decoder module intercepting the data (**leaf cache receives object signature from root cache**, page 16, lines 29-30 and Fig. 1), the decoder module receiving data blocks (**object signatures**, page 16, lines 13-14) for different communication sessions (**for communication requests using different protocols such as FTP and HTTP**, page 7, lines 28-32) from a corresponding encoder module (**from the root cache**); and

a memory (**a memory storage**, element 112, Fig. 1), accessible to the decoder module (**accessible to leaf cache**, element 111, Fig. 1), for storing the contents of one or more data blocks previously transmitted by the encoder module (**for caching for previously transmitted object signatures**, page 17, lines 1-4) wherein the decoder module (**leaf cache**, element 111, Fig. 1) determines whether the contents of each of the received data blocks is in

encoded form (**leaf cache determines whether the received data is in object signature form,** page 17, lines 1-4),

wherein responsive to the respective data block being in encoded form (**if web object is in object signature form is received in the leaf cache**, page 16, lines 22-30), the decoder module selects the contents of a matching previously received block as the contents of the respective encoded block and the respective extracted data block (**leaf cache selects the web object of the matching object signature,** page 17, lines 1-4);

each of the previously transmitted unique data blocks having a unique identifier (**each of the web objects having a URL as a unique identifier**, page 9, lines 20-26).

wherein responsive to the data block being unencoded, the decoder module stores the contents of the respective received data block as a previously received data block (**when the actual web object is encountered at the leaf cache, the leaf cache stores it to be served to requesting client device**, page17, lines 9-14).

Malcolm does not explicitly disclose the memory comprises a least recently used data structure for storing one or more previously transmitted unique data blocks, said least recently used data structure having a maximum capacity and each of the previously transmitted unique data blocks having a unique identifier and a position in an order of most recently used to least recently used of the one or more stored blocks, and

wherein responsive to the respective data block being in encoded form, associates the previously transmitted data block having the matching contents with the position in the least recently used data structure indicating the most recently used previously transmitted data block.

However, Sarkissian discloses a least recently used data structure having a maximum capacity (LRU) (**CAM array/stack,** col. 31, lines 24-50) in a cache system of a packet network in which the addressable memory cells CAMs are ordered according to recentness of use, with the most recently used cache contents pointed to by the top CAM and the least recently used cache contents pointed to by the bottom CAM (col. 31, lines 41-50). Sarkissian further discloses when there is a cache hit/match, the contents of the CAM that produced the hit are put in the top CAM of the stack while the CAM contents of the CAM above the CAM that produced the hit are shifted down to fill the gap (col. 31, lines 32-40).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the decoding method of Malcolm with the teaching of Sarkissian in employing a least recently used data structure/algorithm such that the leaf cache and root cache disclosed in Malcolm will implement the least recently used data structure of Sarkissian such that the leaf and root caches of Malcolm comprise a least recently used data structure for storing one or more previously transmitted unique data blocks, said least recently used data structure having a maximum capacity and a position in an order of most recently used to least recently used of the one or more stored blocks, and in response to the respective data block being in encoded form, associates the previously transmitted data block having the matching contents with the position in the least recently used data structure indicating the most recently used previously transmitted data block.

The motivation to do so is to employ the least recently used replacement policy in cache system it replaces the least recently used flow entry when a cache replacement is needed because it is likely that a packet following a recent packet will belong to the same flow and thus the

signature of a new packet will likely match a recently used flow record, and it is not highly likely that a packet associated with the least recently used flow-entry will arrive soon.

Malcolm and Sarkissian do not explicitly show the decoder module transmits to the encoder module over the network routing information in accordance with a routing protocol, the routing information including network topology information for the network identifying one or more addresses of client devices that the decoder module supports.

However, Huai discloses a routing protocol OSPF for discovering and exchanging network topology information relating to a link connecting between circuit switches and the link information comprises the IP address of the interfaces of the switches (col. 5, lines 36-67, col. 6, lines 1-20, col. 8, lines 12-52).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the encoding method of Malcolm with the teaching of Huai in showing a routing protocol OSPF for discovering and exchanging network topology information relating to a link connecting between circuit switches and the link information comprises the IP address of the interfaces of the switches such that the routing information transmitted from the decoder to the encoder module in the system of Malcolm will be in accordance with a routing protocol, the routing information including network topology information for the network identifying one or more addresses of client devices that the decoder module supports.

The motivation to do so is to check to see if the link connecting the interfaces of circuit switches is properly provisioned and operational before transmission of IP packets takes place.

Regarding claim 43, Malcolm discloses the system of claim 42 wherein the decoder module (**a leaf cache**, element 111, Fig. 1) is coupled via a switch (**a router-switch**, element 113, Fig. 1) in a physical connection between two nodes of the network (**in a physical connection between a client and a server in a communication network**, elements 120. 130, Fig. 1), responsive to a first configuration of the switch (**responsive to the configuration of processing FTP or HTTP requests**), the encoder module processing data that traverse the physical connection between these two nodes (**the leaf cache processes FTP or HTTP requests**, page 7, lines 28-32), and responsive to a second configuration of the switch (**responsive to the configuration of processing all other types of requests**), the data bypassing the encoder module (**the cache passes through these data unchanged**, page 7, lines 28-32).

Regarding claims 45, Malcolm discloses the system of claim 42 wherein the decoder module, receives an indicator for identifying that the contents of a respective data block have been previously transmitted (**receives a object signature from the root cache for identifying the web object**, page 16, lines 29-30).

Regarding claim 46, Malcolm discloses the system of claim 45 wherein the indicator is a special symbol (**object signature is a special symbol, which is a form of dictionary compression**, page 12, lines 29-32).

Regarding claim 47, Malcolm discloses the system of claim 45 wherein the indicator is an extra header (**object signature is a form of dictionary compression of a web object**, page 12, lines 29-32).

Regarding claim 48, Malcolm discloses the system of claim 42 wherein at least one respective data block is a packet payload (**web object includes text or multimedia data**, page 6, lines 4-21).

Regarding claim 49, Malcolm discloses the system of claim 42 wherein at least one respective data block is a portion of a packet payload (**web object is a portion of the packet payload**, page 6, lines 4-21).

Regarding claim 50, Malcolm discloses the system of claim 42 wherein the decoder module decodes at least one extracted data block (**the leaf cache decodes the object signature**) using a synchronization mechanism for verifying the identification of the one or more previously received data blocks from a corresponding encoder module (**using this object signature as a synchronization mechanism to verify the identification of a previously received web object from a root cache**, page 16, lines 29-30, page 17, lines 1-4).

Regarding claim 51, Malcolm discloses the system of claim 50 wherein the synchronization mechanism is an explicit synchronization mechanism (**root cache receives an object signature from server device**, page 9, lines 3-8).

Regarding claim 58, Malcolm and Huai do not explicitly disclose the decoder module, responsive to no match in contents between the respective received data block and any one of the previously received data blocks, stores the respective received data block in the least recently used data structure and associates the position of most recently used with the respective received data block.

However, Sarkissian discloses when there is cache miss/no match, the contents of cache memory pointed to by the bottom CAM are replaced by the flow-entry from the flow-entry database 324. This now becomes the most recently used entry, so the contents of the bottom CAM are moved to the top CAM and all CAM contents are shifted down (col. 19, lines 63-67, col. 20 , lines 1-2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combined encoding method of Malcolm and Huai with the teaching of Sarkissian in employing a least recently used data structure/algorithm such that the leaf cache and root cache disclosed in Malcolm will implement the least recently used data structure of Sarkissian such that the leaf and root caches of Malcolm comprise a least recently used data structure for storing one or more previously transmitted unique data blocks, said least recently used data structure having a maximum capacity and a position in an order of most recently used to least recently used of the one or more stored blocks, and in response to no match, stores the extracted data block in the least recently used data structure, and associates the position of most recently used with the extracted data block.

The motivation to do so is to employ the least recently used replacement policy in cache system it replaces the least recently used flow entry when a cache replacement is needed because it is likely that a packet following a recent packet will belong to the same flow and thus the signature of a new packet will likely match a recently used flow record, and it is not highly likely that a packet associated with the least recently used flow-entry will arrive soon.

4. Claims 44, 52-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malcolm in view of Sarkissian and Huai, and in further view of Garcia-Luna-Aceves (US Publication 2002/0056416).

Regarding claim 44, the combined system of Malcolm and Sarkissian discloses all the aspects of the claimed invention set forth in the rejection of claim 42 above, except fails to explicitly disclose the encoder deciding a route for the respective extracted data block to the at least one corresponding decoder module supporting its destination address.

Malcolm does not explicitly show the encoder module receives routing information and routing criteria over the network from each of one or more corresponding decoder modules with which it communicates and determines the one or more addresses supported by each respective decoder module from the routing information.

However, Garcia-Luna-Aceves discloses web client receives routing information/criteria such as routing delay and routing distance between a web router and the client, and that the web router determines update network topology information and which of the other web routers support routing for the web client request based on the routing criteria (paragraphs 0043, 0127, 0137).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the encoding method of Malcolm with the teaching of Garcia-Luna-Aceves in determining and forwarding routing information from a web router to a web client such that the root cache of Malcolm will decide a route and forward routing information and routing criteria over the network to the leaf cache.

The motivation to do so is to enable the selection of the optimal route of web routers to service client information object request.

Regarding claims 52-54, the combined system of Malcolm and Sarkissian does not explicitly disclose the system wherein the synchronization mechanism is an implicit synchronization and the implicit synchronization mechanism is a reliable network transport protocol.

However, Garcia-Luna-Aceves discloses the topology information passed between web routers are transported using reliable transmission protocol to provide implicit synchronization (paragraph 0043). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system and method of Malcolm and Sarkissian with the teaching of Garcia-Luna-Aceves in using a reliable transport communication protocol to provide implicit synchronization when updating network topology information. The motivation to do so is to provision reliable transmissions between web routers.

5. Claims 55, 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art, Malcolm et al. (WO 00/07124), in view of Sarkissian et al. (USP 6,771,646) and Huai et al. (USP 6,614785), and in further view of Storer (USP 4,876,541).

Regarding claim 55, the combined system of Malcolm, Sarkissian and Huai does not explicitly disclose the system of claim 42 wherein responsive to the data block being unencoded, the decoder module stores the contents of the respective received data block as a previously received data block further comprises determining whether to delete at least one of the previously received data blocks.

However, Storer discloses when the least recently used data structure is full, the data block being at the position of the least recently used data block is deleted (col. 16, lines 66-68, col. 17, lines 1-6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combined system and method of Malcolm, Sarkissian and Huai with the teaching of Storer in employing a least recently used data structure/algorithm such that the least recently used data structure of the combined system Malcolm, Sarkissian and Huai will delete the previously transmitted data block having the order position of the least recently used data block in response to the least recently used data structure being at the maximum capacity.

The motivation to do so is to create new space for the new flow entry by removing a certain number of the least recently used data blocks at the end of the queue.

Regarding claim 59, the combined system of Malcolm, Huai and Sarkissian does not explicitly show that in response to the least recently used data structure being at the maximum capacity, the encoder module deletes the previously transmitted data block having the order position of the least recently used data block.

However, Storer discloses when the least recently used data structure is full, the data block being at the position of the least recently used data block is deleted (col. 16, lines 66-68, col. 17, lines 1-6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combined system and method of Malcolm and Garcia-Luna-Aceves with the teaching of Storer in employing a least recently used data structure/algorithm such that the least recently used data structure of the combined system Malcolm and Garcia-Luna-Aceves delete the previously transmitted data block having the order position of the least recently used data block in response to the least recently used data structure being at the maximum capacity.

The motivation to do so is to create new space for the new flow entry by removing a certain number of the least recently used data blocks at the end of the queue.

6. Claims 63-68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malcolm in view of Sarkissian and Huai, and in further view of Adriano et al. (USP 6,484,210).

Regarding claim 63, the combined system of Malcolm, Sarkissian and Huai discloses all the aspects of claim 42 above, except fails to explicitly show that a decapsulation module for decapsulating a block of data received (**decapsulator module for decapsulating UDP packet**

500, col. 10, lines 31-50, Fig. 5) over the network from a source address supported by a corresponding encoder module (**from a source address of an encoder module**, col. 10, lines 31-50 and Fig. 5).

However, Adriano discloses a system further comprises a decapsulation module for decapsulating a block of data received (**decapsulator module for decapsulating UDP packet 500**, col. 10, lines 31-50, Fig. 5) over the network from a source address supported by a corresponding encoder module (**from a source address of an encoder module**, col. 10, lines 31-50 and Fig. 5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combined system and method of Malcolm and Sarkissian with the teaching of Adriano such that the decapsulation module of Malcolm decapsulates UDP packet using the IP source address of the encoder module.

The motivation to do so is to identify the source from which the packet is originated.

Regarding claims 64-68, Malcolm discloses the system of claim 63 wherein the received data block is included in a packet (**web object is included in a MPEG packet**, page 6, lines 4-21). Malcolm does not explicitly disclose the packet has been decapsulated as one packet from inside another packet and decapsulating the received block of data of a model describing the flow of data across a network and decoding the received block of data at a second layer of the model, first layer and second layer being the same layer.

However, Adriano discloses a system that comprises a decapsulation module for decapsulating a block of data received (**decapsulator module for decapsulating UDP packet**

500, col. 10, lines 31-50, Fig. 5) over the network from a source address supported by a corresponding encoder module (**from a source address of an encoder module**, col. 10, lines 31-50 and Fig. 5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combined system and method of Malcolm and Sarkissian with the teaching of Adriano such as decapsulating TCP packet 555 from within a UDP packet 500 (TCP and UDP are the same layer and TCP is a connection-oriented layer and UDP is a connectionless layer) such that the packet disclosed in Malcolm will be decapsulated as one TCP packet from inside a UDP packet.

The motivation to do so is to route the entire TCP packet tunneled within the UDP packet to the destination IP address of the TCP packet.

7. Claims 69-70, 85-87 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art, Malcolm et al. (WO 00/07124) in view of Huai et al. (USP 6,614,785).

Regarding claim 69, Malcolm discloses a system for decoding one or more repetitive data blocks in data communicated over a network comprising:

an decoder module (**a leaf cache**, element 111, Fig. 1), coupled in the network (**coupled in a communication network**, element 100, Fig. 1); and

a memory (**a memory storage**, element 112, Fig. 1), accessible to the decoder module (**accessible to leaf cache**, element 111, Fig. 1), for storing the contents of one or more data blocks previously received from the encoder module (**for caching for previously transmitted object signatures**, page 17, lines 1-4),

wherein the decoder module (**leaf cache**, element 111, Fig. 1) determines whether the contents of each of the received data blocks is in encoded form (**leaf cache determines whether the received data is in object signature form**, page 17, lines 1-4),

wherein responsive to the respective data block being in encoded form (**if web object is in object signature form is received in the leaf cache**, page 16, lines 22-30), the decoder module selects the contents of a matching previously received block as the contents of the respective encoded block and the respective extracted data block (**leaf cache selects the web object of the matching object signature,** page 17, lines 1-4);

wherein responsive to the data block being unencoded, the decoder module stores the contents of the respective received data block as a previously received data block (**when the actual web object is encountered at the leaf cache, the leaf cache stores it to be served to requesting client device**, page 17, lines 9-14).

Malcolm does not explicitly show the decoder module transmits to the encoder module over the network routing information in accordance with a routing protocol, the routing information including network topology information for the network identifying one or more addresses of client devices that the decoder module supports.

However, Huai discloses a routing protocol OSPF for discovering and exchanging network topology information relating to a link connecting between circuit switches and the link information comprises the IP address of the interfaces of the switches (col. 5, lines 36-67, col. 6, lines 1-20, col. 8, lines 12-52).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the encoding method of Malcolm with the teaching of Huai in showing a routing protocol OSPF for discovering and exchanging network topology information relating to a link connecting between circuit switches and the link information comprises the IP address of the interfaces of the switches such that the routing information transmitted from the decoder to the encoder module in the system of Malcolm will be in accordance with a routing protocol, the routing information including network topology information for the network identifying one or more addresses of client devices that the decoder module supports.

The motivation to do so is to check to see if the link connecting the interfaces of circuit switches is properly provisioned and operational before transmission of IP packets takes place.

Regarding claim 70, Malcolm does not disclose the decoder module participates in one or more routing protocols for obtaining routing information.

However, Huai discloses web routers use routing information provided by routing protocols such as OSPF (col. 8, lines 12-52).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the encoding method of Malcolm with the teaching of Huai in determining and forwarding routing information from a web router to a web client using different routing protocols such as OSPF.

The motivation to do so is to use the OSPF protocol to automatically discover and propagate information relating to a link connecting two circuit switches.

Regarding claim 85, Malcolm discloses a system for decoding one or more repetitive data blocks in data communicated over a network comprising:

transmitting routing information (**web object with URL address**) for identifying one or more addresses of client devices (**URL being the destination address of a device where the web object is located**) that a decoder module supports over a network to an encoder module (**each web object destined to a leaf cache having a URL address**, page 9, lines 20-26)

an decoder module (**a leaf cache**, element 111, Fig. 1), coupled in the network (**coupled in a communication network**, element 100, Fig. 1), the decoder module intercepting the data (**leaf cache receives object signature from root cache**, page 16, lines 29-30 and Fig. 1), the decoder module receiving data blocks (**object signatures**, page 16, lines 13-14) for different communication sessions (**for communication requests using different protocols such as FTP and HTTP**, page 7, lines 28-32) from a corresponding encoder module (**from the root cache**); and

a memory (**a memory storage**, element 112, Fig. 1), accessible to the decoder module (**accessible to leaf cache**, element 111, Fig. 1), for storing the contents of one or more data blocks previously transmitted by the encoder module (**for caching for previously transmitted object signatures**, page 17, lines 1-4) wherein the decoder module (**leaf cache**, element 111, Fig. 1) determines whether the contents of each of the received data blocks is in encoded form (**leaf cache determines whether the received data is in object signature form,** page 17, lines 1-4),

wherein responsive to the respective data block being in encoded form (**if web object is in object signature form is received in the leaf cache**, page 16, lines 22-30), the decoder module selects the contents of a matching previously received block as the contents of the respective encoded block and the respective extracted data block (**leaf cache selects the web object of the matching object signature,** page 17, lines 1-4);

wherein responsive to the data block being unencoded, the decoder module stores the contents of the respective received data block as a previously received data block (**when the actual web object is encountered at the leaf cache, the leaf cache stores it to be served to requesting client device**, page17, lines 9-14).

Malcolm does not explicitly show transmitting routing information in accordance with a routing protocol for the network identifying one or more addresses of client devices that the decoder module supports over a network to encoder module, wherein the routing information including network topology information for the network.

However, Huai discloses a routing protocol OSPF for discovering and exchanging network topology information relating to a link connecting between circuit switches and the link

information comprises the IP address of the interfaces of the switches (col. 5, lines 36-67, col. 6, lines 1-20, col. 8, lines 12-52).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the encoding method of Malcolm with the teaching of Huai in showing a routing protocol OSPF for discovering and exchanging network topology information relating to a link connecting between circuit switches and the link information comprises the IP address of the interfaces of the switches such that the system of Malcolm will show transmitting routing information in accordance with a routing protocol for the network identifying one or more addresses of client devices that the decoder module supports over a network to encoder module, wherein the routing information including network topology information for the network.

The motivation to do so is to check to see if the link connecting the interfaces of circuit switches is properly provisioned and operational before transmission of IP packets takes place.

Regarding claims 86, Malcolm discloses the system of claim 85 further comprising receiving an indicator for identifying that the contents of a respective data block have been previously transmitted (**receives a object signature from the root cache for identifying the web object**, page 16, lines 29-30).

Regarding claim 87, Malcolm discloses the method of claim 85 further comprising the identification of the one or more previously received data blocks from a corresponding encoder module (**each of the web objects having a URL as a unique identifier**, page 9, lines 20-26).

8. Claim 88 is rejected under 35 U.S.C. 103(a) as being unpatentable over Malcolm in view Huai, and in further view of Storer (4,876,541).

Regarding claim 88, Malcolm discloses the method of claim 85 further comprising responsive to the data block being unencoded, the decoder module stores the contents of the respective received data block as a previously received data block (**when the actual web object is encountered at the leaf cache, the leaf cache stores it to be served to requesting client device**, page17, lines 9-14).

Malcolm and Huai do not explicitly show determining whether to delete at least one of the previously received data blocks.

However, Storer discloses when the least recently used data structure is full, the data block being at the position of the least recently used data block is deleted (col. 16, lines 66-68, col. 17, lines 1-6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combined system and method of Malcolm with the teaching of Storer in employing a least recently used data structure/algorithm such that the least recently used data structure of the combined system Malcolm will delete the previously transmitted data block having the order position of the least recently used data block in response to the least recently used data structure being at the maximum capacity.

The motivation to do so is to create new space for the new flow entry by removing a certain number of the least recently used data blocks at the end of the queue.

9. Claims 89-91 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art, Malcolm et al. (WO 00/07124) in view of Huai et al. (USP 6,614,785), and in further view of Sarkissian et al. (USP 6,771,646).

Regarding claims 89-91, Malcolm and Huai do not explicitly disclose the memory comprises a least recently used data structure for storing one or more previously received unique data blocks, said least recently used data structure having a maximum capacity and each of the previously received unique data blocks having a unique identifier and a position in an order of most recently used to least recently used of the one or more stored blocks, and

wherein responsive to the respective data block being in encoded form, associates the previously transmitted data block having the matching contents with the position in the least recently used data structure indicating the most recently used previously transmitted data block.

However, Sarkissian discloses a least recently used data structure having a maximum capacity (LRU) (**CAM array/stack**, col. 31, lines 24-50) in a cache system of a packet network in which the addressable memory cells CAMs are ordered according to recentness of use, with the most recently used cache contents pointed to by the top CAM and the least recently used cache contents pointed to by the bottom CAM (col. 31, lines 41-50). Sarkissian further discloses when there is a cache hit/match, the contents of the CAM that produced the hit are put in the top CAM of the stack while the CAM contents of the CAM above the CAM that produced the hit are shifted down to fill the gap (col. 31, lines 32-40).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the decoding method of Malcolm and Huai with the teaching of Sarkissian in employing a least recently used data structure/algorithm such that the leaf cache

and root cache disclosed in Malcolm will implement the least recently used data structure of Sarkissian such that the leaf and root caches of Malcolm comprise a least recently used data structure for storing one or more previously transmitted unique data blocks, said least recently used data structure having a maximum capacity and a position in an order of most recently used to least recently used of the one or more stored blocks, and in response to the respective data block being in encoded form, associates the previously transmitted data block having the matching contents with the position in the least recently used data structure indicating the most recently used previously transmitted data block.

The motivation to do so is to employ the least recently used replacement policy in cache system it replaces the least recently used flow entry when a cache replacement is needed because it is likely that a packet following a recent packet will belong to the same flow and thus the signature of a new packet will likely match a recently used flow record, and it is not highly likely that a packet associated with the least recently used flow-entry will arrive soon.

10. Claim 92 is rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art, Malcolm et al. (WO 00/07124), in view of Huai et al. (USP 6,614785) and Sarkissian et al. (USP 6,771,646), and in further view of Storer (USP 4,876,541).

Regarding claim 92, the combined system and method of Malcolm, Huai and Sarkissian does not explicitly disclose in response to the least recently used data structure being at the maximum capacity, deleting the previously received data block having the order position of the least recently used data block,

However, Storer discloses when the least recently used data structure is full, the data block being at the position of the least recently used data block is deleted (col. 16, lines 66-68, col. 17, lines 1-6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combined system and method of Malcolm, Huai and Sarkissian with the teaching of Storer in employing a least recently used data structure/algorithm such that the least recently used data structure of the combined system Malcolm and Sarkissian will delete the previously transmitted data block having the order position of the least recently used data block in response to the least recently used data structure being at the maximum capacity.

The motivation to do so is to create new space for the new flow entry by removing a certain number of the least recently used data blocks at the end of the queue.

11. Claims 93-95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malcolm in view of Huai et al., and in further view of Adriano et al. (6,484,210).

Regarding claims 93-95, the combined system of Malcolm and Huai does not explicitly disclose the packet has been decapsulated as one packet from inside another packet and decapsulating the received block of data of a model describing the flow of data across a network and decoding the received block of data at a second layer of the model, first layer and second layer being the same layer.

However, Adriano discloses a system further comprises a decapsulation module for decapsulating a block of data received (**decapsulator module for decapsulating UDP packet**

500, col. 10, lines 31-50, Fig. 5) over the network from a source address supported by a corresponding encoder module (**from a source address of an encoder module**, col. 10, lines 31-50 and Fig. 5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combined system and method of Malcolm with the teaching of Adriano such as decapsulating TCP packet 555 from within a UDP packet 500 (TCP and UDP are the same layer and TCP is a connection-oriented layer and UDP is a connectionless layer) such that the packet disclosed in Malcolm will be decapsulated as one TCP packet from inside a UDP packet.

The motivation to do so is to route the entire TCP packet tunneled within the UDP packet to the destination IP address of the TCP packet.

Allowable Subject Matter

12. Claims 2-15, 18-41, 60-62, 71-81, 83-84 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

In claim 2, a system for encoding one or more repetitive data blocks in data communicated over a network comprising:

the encoder module determining whether the client device is supported for decoding by at least one corresponding decoder module based on the destination address of the client device, and the encoder module passing through the data when the destination address of the client device is not supported for decoding by a decoder module.

In claim 18, a system for encoding one or more repetitive data blocks in data communicated over a network comprising:

the encoder module determining whether the client device is supported for decoding by at least one corresponding decoder module based on the destination address of the client device, and the encoder module passing through the data when the destination address of the client device is not supported for decoding by a decoder module.

In claim 20, a system for encoding one or more repetitive data blocks in data communicated over a network comprising:

further comprising a synchronization mechanism including a same size for the least recently used data structure as the size of a second least recently used data structure accessible by

the corresponding decoder module receiving the respective extracted data block, and a reliable network transport protocol being used for the
transmission of the respective extracted data block.

In claim 21, a system for encoding one or more repetitive data blocks in data communicated over a network comprising:

a synchronization mechanism including an installed flag associated each of the previously transmitted data blocks in the least recently used data structure, the installed flag indicating whether the associated data block has been stored in a second least recently used data structure accessible by the corresponding decoder module that has received the respective extracted data block.

In claim 26, a system for encoding one or more repetitive data blocks in data communicated over a network comprising:

a hash table having one or more bins for associating a signature with one or more of the previously transmitted data blocks, the computed signature value being less than the number of hash table bins.

In claim 27, a system for encoding one or more repetitive data blocks in data communicated over a network comprising:

a hash table having one or more bins for associating a signature with one or more of the previously transmitted data blocks, the computed signature value being computed as a modulo of the number of bins.

In claim 37, a system for encoding one or more repetitive data blocks in data communicated over a network comprising:

the encoder module determining whether the client device is supported for decoding by at least one corresponding decoder module based on the destination address of the client device, and the encoder module passing through the data when the destination address of the client device is not supported for decoding by a decoder module.

In claim 60, a system for decoding one or more repetitive data blocks in data communicated over a network comprising:

a synchronization mechanism including a same size for the least recently used data structure as the size of a second least recently used data structure accessible by the corresponding encoder module that transmitted the respective received data block, and a reliable network transport protocol being used for the transmission of the respective received data block.

In claim 61, a system for decoding one or more repetitive data blocks in data communicated over a network comprising:

a synchronization mechanism including a same size for the least recently used data structure as the size of a second least recently used data structure accessible by the corresponding

encoder module, an indicator for each received data block indicating whether the received data block has been previously associated with the second least recently used data structure, and an installation acknowledgement transmitting by the decoder module to the corresponding encoder module responsive to an installation of each received block in the least recently used data structure.

In claim 62, a system for decoding one or more repetitive data blocks in data communicated over a network comprising:

a synchronization mechanism wherein the decoder module receives a version number of the previously received data block having the matching contents, the version number indicating how many times the identifier for this data block has been re-used.

In claim 71, a system for decreasing one or more repetitive data blocks in data communicated over a network comprising:

the encoder module determining whether the client device is supported for decoding by at least one corresponding decoder module based on the destination address of the client device, and the encoder module passing through the data when the destination address of the client device is not supported for decoding by a decoder module.

In claim 72, a method for encoding one or more repetitive data blocks in data communicated over a network comprising:

determining, from the routing information, one or more destination addresses of client device that is supported by each respective decoder module; and

each extracted block having a destination address for the client device to which the intercepted data is destined; and

passing through the data when the destination address of the client device to which the intercepted data is destined is not one of the client devices supported for decoding by the one or more decoder modules.

In claim 77, a method for encoding one or more repetitive data blocks in data communicated over a network comprising:

determining, based on destination address of the client device, whether the client device is supported for decoding by at least one corresponding decoder module; and

passing through the data when the destination address of the client device is not supported for decoding by a decoder module.

Response to Arguments

13. Applicant's arguments with respect to claims 42-55, 58-59, 63-70, 85-95 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Mew whose telephone number is 571-272-3141. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on 571-272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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SUPERVISORY PATENT EXAMINER 7/9/07